

JOHN C. ALDRIN

Address:

(b) (6)

Phone:

(b) (6)

E-mail:

(b) (6)

Education

Northwestern University, Evanston, IL 60208

Theoretical and Applied Mechanics, Doctor of Philosophy, June 2001

Dissertation: Models and Classification Procedures for Ultrasonic Inspection of Holes for Fatigue Cracks (Prof. J. D. Achenbach - Major Professor)

Purdue University, West Lafayette, IN 47907

Mechanical Engineering, Master of Science, May 1996

Purdue University, West Lafayette, IN 47907

Mechanical Engineering, Bachelor of Science, May 1994, With Distinction

Work

Experience

Computational Tools, Gurnee, IL 60031

Engineering Consultant, February 2001 to present

- Specialize in research and applications development services on nondestructive evaluation (NDE) modeling and simulation, data analysis, inverse methods and reliability assessment.
- As Visiting Scientist with AFRL/RXCA, developed strategy and conducted research on computational methods in NDE of aircraft structures and propulsion components.
- Performed research and development of models in ultrasonic and eddy current NDE.
- Developed algorithms with SAIC Ultra Image Int. for automated ultrasonic inspections for C-130 beam cap holes and C-130 hat section / rainbow fitting holes.
- Developed methods and performed demonstrations for model-assisted probability of detection (MAPOD) evaluation for NDE and structural health monitoring applications.
- Provided services to: USAF/AFRL, NASA, SAIC, iTi/Mistras, TRI/Austin, Victor Technologies, BP, Southern Research, Radiance Technologies, Intelligent Automation Inc., Vibrant Corp.
- Participate as member of NASA NESC TDT on Nondestructive Evaluation.

Northwestern University, Center for Quality Engineering, Evanston, IL 60208

Graduate Research Assistant, January 1998 – February 2001

- Developed a simulation of the scattering of an ultrasonic transducer signal by a C-141 weep hole
- Developed algorithm using neural networks to detect bottom and top cracks in weep holes.
- Designed and implemented PC software for automated ultrasonic inspection of weep holes.
- Developed models and ultrasonic inspection procedures for special holes cases: fluid filled cavity, cavity with elastic insert and stiffness interface, cavity with elastic coating.

Whirlpool Corporation, Benton Harbor, MI 49022

Project Engineer, May 1996 - December 1997

- Developed and implemented novel automatic washer spin dynamics test platform.
- Performed fundamental experimental studies on automatic washer suspension performance.
- Developed strategy and performed investigations for the application of sensors to washers.

Purdue University, Herrick Laboratories, West Lafayette, IN 47907

Graduate Research Assistant, January 1995 - May 1996

- Performed review of the state-of-the-art in vibration control systems.
- Developed analysis methodology and performed assessment of the most promising vibration control systems for application to automatic washer suspension design.
- Performed analytical investigations of adaptive passive automatic washer suspension concepts.

- Publications**
1. Aldrin, J. C., “The Human-Machine Interface (HMI) with NDE 4.0 Systems,” *Handbook on Nondestructive Evaluation 4.0*, Meyendorf, N., Ida, N., Singh, R., Vrana, J. (Eds.), (2021) ISBN 978-3-030-73207-3.
 2. Aldrin, J. C., Knopp, J., Sabbagh, H. A., “Bayesian Methods in Probability of Detection Estimation and Model-assisted Probability of Detection (MAPOD) Evaluation,” *Review of Progress in QNDE*, Vol. 32, AIP Conf. Proc. 1511, pp.1733-1740, (2013).
 3. Sabbagh, H. A., Murphy, R. K., Sabbagh, E. H., Aldrin, J. C., and Knopp, J. S., *Computational Electromagnetics and Model-Based Inversion - A Modern Paradigm for Eddy-Current Nondestructive Evaluation*, Springer, 2013.
 4. Aldrin, J. C., Medina, E. A., Santiago, J., Lindgren, E. A., Buynak, C., Knopp, J., “Demonstration study for reliability assessment of SHM systems incorporating model-assisted probability of detection approach,” *Review of Progress in QNDE*, Vol. 31, AIP Conf. Proc. 1430, pp.1543-1550, (2012).
 5. Aldrin, J. C., Knopp, J. S., Blodgett, M. P., and Sabbagh, H. A., “Uncertainty Propagation in Eddy Current Inverse Problems”, *Review of Progress in QNDE*, Vol. 30, AIP, pp. 631-638, (2011).
 6. Aldrin, J. C., Medina, E. A., Lindgren, E. A., Buynak, C. F., Knopp, J. S., “Protocol for Reliability Assessment of Structural Health Monitoring Systems Incorporating Model-assisted Probability of Detection (MAPOD) Approach,” *Proceedings of the 8th International Workshop on Structural Health Monitoring*, Ed. F.-K. Chang, Stanford, CA (September 13-15, 2011).
 7. Aldrin, J. C., Blodgett, M. P., Lindgren, E. A., Steffes, G. J., and Knopp, J. S., “Scattering of obliquely incident shear waves from a cylindrical cavity”, *Journ. Acoust Soc. America*, 129, pp. 3661-3675 (2011)
 8. Aldrin, J. C. and Knopp, J. S., “Modeling and Simulation for Nondestructive Testing with Applications to Aerospace Structures”, *Materials Evaluation*, Vol. 66, n 1, p. 53-59, (2008).
 9. Aldrin, J. C., Kropas-Hughes, C. V., Knopp, J., Mandeville, J. R., Judd, D., Lindgren, E., “Advanced Echo-Dynamic Measures for the Characterization of Multiple Ultrasonic Signals in Aircraft Structures”, *Insight – Journal of the British Institute of Non-Destructive Testing*, Vol. 48, n 3, pp. 144-148, (2006).
 10. Aldrin, J., “Overview of Mathematical Modeling in Nondestructive Evaluation (NDE),” *Nondestructive Testing Information Analysis Center*, NT-SP-01-03, (2002).
 11. Aldrin, J., Achenbach, J. D., Andrew, G., P’an, C., Grills, B., Mullis, R. T., Spencer, F. W., Golis, M., “Case Study for the Implementation of an Automated Ultrasonic Technique to Detect Fatigue Cracks in Aircraft Weep Holes,” *Materials Evaluation*, Vol. 59, n 11, p.1313, (2001).
- Awards and Activities**
- 2017 American Society of Nondestructive Testing (ASNT) Fellow.
 - 2010 TTCP (The Technical Cooperation Program) Team Achievement Award (for Model-Based Methods for Reducing Cost Associated with POD Studies, with Canada and Australia).
 - 2009 NASA Engineering and Safety Center (NESC) Engineering Excellence Award.
 - 2006 Young NDT Professional Award (ASNT).
 - 2002 Outstanding Paper Award, *Materials Evaluation* (ASNT).
 - Associate Technical Editor: *Materials Evaluation* (2013-date)
 - Associate Technical Editor: *Journal of Nondestructive Evaluation* (2022-date)
 - President - Mechanics Club - Northwestern University (1999-2000 academic year).
 - Volunteer Docent - Oriental Institute Museum - University of Chicago (2003 to date)
- Affiliations**
- Member - The American Society of Nondestructive Testing (ASNT)
 - Member – ASNT Reliability Committee (2002 to date)
 - Member – ASNT Research Council (2005 to date)
 - Member – ASNT NDT 4.0 Committee (2019 to date)
 - Member - The American Society of Mechanical Engineers (ASME)
 - Member - The Acoustical Society of America (ASA)
 - Member - The Institute of Electrical and Electronics Engineers (IEEE)